## IN THE CLAIMS

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Original) A broadcasting signal transforming apparatus for transforming digital television (TV) broadcasting signals into digital radio broadcasting signals, comprising:

a transport stream generating means for receiving and transforming TV broadcasting signals inputted from outside into digital TV broadcasting transport streams;

a broadcasting transport format transforming means for transforming the digital TV broadcasting transport streams in conformity to a digital radio broadcasting transport protocol and generating digital radio broadcasting transport streams based on a radio broadcasting schedule;

a broadcasting multiplexing means for multiplexing the digital radio broadcasting transport streams generated in the broadcasting transport format transforming means;

a modulating/up-converting means for modulating the digital radio broadcasting transport streams multiplexed in the broadcasting multiplexing means in a modulation method for digital radio broadcasting and up-converting frequencies of the modulated radio broadcasting signals into radio frequency (RF) signals; and

a high-power amplifying means for amplifying the RF signals obtained from modulation and up-conversion in the modulating/up-converting means to thereby transmit the amplified RF signals through a transmitting antenna.

2. (Original) The broadcasting signal transforming apparatus as recited in claim 1, wherein the transport stream generating means includes:

a tuning means for selecting digital TV broadcasting signals of a particular channel among digital TV broadcasting signals inputted from outside through an antenna and communication cable and outputting the selected digital TV broadcasting signals in a form of intermediate frequency (IF) analog broadcasting signals; and

a baseband processing means for digitalizing and demodulating the IF analog broadcasting signals outputted in the tuning means to thereby transform the IF analog broadcasting signals into digital TV broadcasting transport streams.

3. (Original) The broadcasting signal transforming apparatus as recited in claim 1, wherein the transport stream generating means further includes:

a signal transforming unit for transforming TV broadcasting signals inputted from outside through a proprietary line into digital TV broadcasting transport streams.

4. (Original) The broadcasting signal transforming apparatus as recited in claim 1, wherein the broadcasting transport format transforming means includes:

a transport demultiplexing means for demultiplexing the digital TV broadcasting transport streams obtained from the transformation in the transport stream generating means into transport streams having digital TV broadcasting service information (SI) and audio/video (A/V) data and transport streams having data;

an SI decoding means for receiving and analyzing the digital TV broadcasting service information transmitted from the transport demultiplexing means;

an interfacing means for generating packet identifiers for programs related to the radio broadcasting schedule and program configuration information based on digital TV broadcasting service information analysis information inputted from the SI decoding means and the radio broadcasting schedule inputted from outside;

a scheduling means for receiving the packet identifiers and program configuration information generatd in the interfacing means, transmitting the packet identifiers to an A/V transport stream filtering means and a data transport stream filtering means, and transmitting the program configuration information to a digital radio broadcasting SI generating means based on broadcasting time;

the digital radio broadcasting SI generating means for reconfiguring service information for digital radio broadcasting based on the digital TV broadcasting service information transmitted from the SI decoding means and the program configuration information transmitted from the scheduling means;

a Moving Picture Experts Group 2 (MPEG-2) Program Specific Information (PSI) generating means for defining MPEG-2 PSI based on the reconfigured service information reconfigured in the digital radio broadcasting SI generating means;

a digital radio broadcasting SI carousel transmitting means for transmitting the reconfigured service information reconfigured in the digital radio broadcasting SI generating means in a carousel method periodically;

an A/V transport stream filtering means for separating A/V transport stream corresponding to a packet identifier from the A/V transport stream outputted from the transport demultiplexing means based on the packet identifier transmitted from the scheduling means;

an A/V transcoding means for transforming a definition, a data bit rate and a compression method of audio/video, which are output signals of the A/V transport stream filtering means;

the data transport stream filtering means for separating data transport stream corresponding to a packet identifier from the data transport stream inputted from the transport demultiplexing means based on the packet identifier transmitted from the scheduling means;

a data broadcasting format transforming means for reconfiguring the digital TV broadcasting data transport stream transmitted from the data transport stream filtering means into digital radio broadcasting data transport stream in conformity to a digital radio broadcasting transport protocol;

an MPEG PSI generating means for defining MPEG PSI based on the reconfigured service

information reconfigured in the digital radio broadcasting SI generating means; and

a transport remultiplexing means for multiplexing the A/V transport stream outputted from the A/V transcoding means, the digital radio broadcasting data transport stream outputted from the data broadcasting format transforming means, and the MPEG PSI defined in the MPEG PSI generating means.

5. (Original) The broadcasting signal transforming apparatus as recited in claim 4, wherein the broadcasting transport format transforming means further includes a storing means for storing the digital radio broadcasting data stream outputted from the data broadcasting format transforming means, the remultiplexed transport stream outputted from the transport remultiplexing means, and the digital radio broadcasting SI stream outputted from the digital radio broadcasting SI carousel transmitting means.

6. (Original) The broadcasting signal transforming apparatus as recited in claim 5, wherein the scheduling means further performs a function of transmitting a control signal transmitted through the interfacing means based on an external request to the transport remultiplexing means; and

the transport remultiplexing means further performs a function of extracting and multiplexing audio transport stream from the A/V transport stream outputted from the A/V transcoding means.

7. (Original) The broadcasting signal transforming apparatus as recited in claim 6, wherein the data broadcasting format transforming means includes:

a transport receiving means for receiving a predetermined number of digital TV broadcasting data transport streams outputted from the data transport stream filtering means;

a transport section decoding means for separating the received digital TV broadcasting data transport streams on a section basis and separating the separated sections into header information and a data block;

a header information analyzing and transforming means for analyzing and transforming the

separated header information of digital TV broadcasting into header information of digital radio

broadcasting transport protocol;

a data block transforming means for transforming the separated data block of digital TV

broadcasting into a data block of digital radio broadcasting transport protocol; and

a digital radio broadcasting data transport format encoding means for configuring digital radio

broadcasting data transport streams based on the header information and the data block which are

transformed in conformity to the digital radio broadcasting transport protocol.

8. (Original) The broadcasting signal transforming apparatus as recited in claim 7, wherein in the

header transforming process in the header information analyzing and transforming means, in a case where

a digital TV broadcasting data download protocol is transformed into a Eureka-147 digital radio

broadcasting multimedia object transport (MOT) protocol, data values of module information

(moduleInfoBytes), transaction identifier (transactioId), and block size for digital TV broadcasting are

allocated as data values for a transport identifier (transported), a group identifier (groupId), and a

bodysize of the Eureka-147 digital radio data broadcasting.

9. (Original) The broadcasting signal transforming apparatus as recited in claim 8, wherein in the

digital radio broadcasting data transport stream configuring process in the digital radio broadcasting data

transport format encoding means, an MSC data group data field is configured by coupling each of a

header core including the body size data, an extension header including the group identifier (groupId)

data, and a data block (body segment) of a digital radio broadcasting transport protocol which is

transformed in the data block transforming means with a corresponding segmentation header, and then an

MSC data group is configured by coupling each of the MSC data group data fields with a session header

having the transport identifier (transportId), an MSC data group header, and an error detecting code.

10. (Original) The broadcasting signal transforming apparatus as recited in claim 7, wherein the SI decoding means extracts table information by analyzing service information inputted from the transport demultiplexing means and then extracting a transport stream identifier (Transport_stream_id), a program number, a program source identifier, an event identifier, Universal Time Coordinated (UTC), a program local start time, a program length, and a program title from the extracted table information.

11. (Original) The broadcasting signal transforming apparatus as recited in claim 10, wherein the table information includes a Program Association Table (PAT), a Conditional Access Table (CAT), a Program Map Table (PMT), a Master Guide Table (MGT), a System Time Table (STT), a Television Virtual Channel Table (TVCT), a Rating Region Table (RRT), and an Event Information Table (EIT).

12. (Original) The broadcasting signal transforming apparatus as recited in claim 11, wherein the SI reconfiguration process in the digital radio broadcasting SI generating means includes:

directly transforming time information of the system time table (STT) into time information of Fast Information Group (FIG) type 1 extension type 1 (FIG 0/1);

directly transforming new service identifiers (SId and newSId) of FIG type 0 extension type 16 (FIG 0/16) by coupling program source information of the TVCT with event information;

transforming the program local start time and the program length of the EIT into programs numbers (PNum and new PNum) of FIG type 0 extension type 16 (FIG 0/16);

transforming the program title into a characteristic field of FIG type 1 extension type 5 (FIG 1/5); and

generating service information related to MCI configuration which is to be stored in "FIG type 0 extension type 0 (FIG 0/0)," "FIG type 0 extension type 2 (FIG 0/2)," "FIG type 0 extension type 3 (FIG 0/3)," and "FIG type 0 extension type 8 (FIG 0/8)," label-related service information which is to be stored in "FIG type 1 extension type 0 (FIG 1/0)" and "FIG type 1 extension type 4 (FIG 1/4)," and service

information related to program configuration which is to be stored in "FIG type 0 extension type 10 (FIG

0/10)" and "FIG type 0 extension type 16 (FIG 0/16)" by reconfiguring the program configuration

information transmitted from the scheduling means based on a Eureka-147 protocol.


13. (Original) A broadcasting signal transforming method for transforming digital television (TV)

broadcasting signals into digital radio broadcasting signals, comprising the steps of:

transforming television (TV) broadcasting signals into digital TV broadcasting transport streams;

generating digital radio broadcasting transport streams by transforming the digital TV

broadcasting transport streams in conformity to a digital radio broadcasting transport protocol based on a

radio broadcasting schedule;

generating transport streams;

multiplexing the generated digital radio broadcasting transport streams;

modulating the multiplexed digital radio broadcasting transport streams in a modulation method

of digital radio broadcasting;

up-converting frequencies of the modulated radio broadcasting signals into radio frequency (RF)

signals; and

amplifying and transmitting the up-converted RF signals.